Technical Specification of the Passive Network Termination Point in the DOCSIS 3.0 Network of NetCologne

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von: M. Rüsel	Von: T.Henritzi	Von: T.Henritzi

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0.1	22.07.2016	M. Rüsel	Initial version
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1 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document. At the time of publication, the editions indicated were valid. All listed references are subject to revision; users of this specification are therefore encouraged to investigate the possibility of applying the most recent edition of the references listed below.

[1] AGB: Allgemeine Geschäftsbedingungen der NetCologne GmbH

[2] ANGA “Specification for the passive Network Termination Point in DOCSIS 3.0 Environment Network and Provisioning requirements (Version 1.01)”

[3] NetCologne: “Interface Specification of the SIP Interface between User Equipment and the NGN Platform of NetCologne”

[4] IETF RFC 2131: “Dynamic Host Configuration Protocol”

[5] CableLabs “Data Over Cable Service Interface Specifications, DOCSIS 3.0 MAC and Upper Layer Protocols Interface Specification CM-SP-MULPIv3.0”

[6] CableLabs “Data-Over-Cable Service Interface Specifications, IPv4 and IPv6 eRouter Specification, CM-SP-eRouter-I20-190515

[7] IETF RFC 6333: Dual-Stack Lite Broadband Deployments Following IPv4 Exhaustion

[8] IETF RFC 6334: Dynamic Host Configuration Protocol for IPv6 (DHCPv6) Option for Dual-Stack Lite

2 Scope

This interface specification describes the functioning of the interface at the passive Network Termination Point in the DOCSIS 3.0 network of NetCologne according to Sec. 5 FTEG (German law on radio equipment and terminal equipment). The characteristics given in this document are intended to be used to derive and specify requirements for equipment such as cable modems to connect them to the dedicated data interface.

This interface specification may be changed at any time to reflect changes made to the network. Anyone using this specification is requested to regularly check for the newest version at the respective Website.

3 Data Services

The interface specifications for Data services are described in the ANGA document “Specification for the passive Network Termination Point in DOCSIS 3.0 Environment Network and Provisioning requirements” [2]. A cable device connected to the pNTP of the NetCologne cable network must be compliant to this specification.

The IAD must support DS-Lite according to [7]. The name of the Address Family Transition Router (AFTR) is assigned via DHCPv6 Option Code 64 as stated in [8]. A manual configuration of the AFTR name is not supported. For DS-Lite operation only an IPv6 Prefix is assigned, no IPv4 address.

4 VoIP Service

A cable device that is connected via the pNTP to the NetCologne cable network can use VoIP services that correspond to the purchased product.

This chapter describes the parameters and functionalities used to set up the VoIP service on the pNTP.

4.1 Supported VoIP Protocol

The SIP protocol is supported. The functional interface specification of the SIP protocol for a User Equipment (UE) connected to the NGN platform of NetCologne is described in [3]. A SIP device (e.g. a MTA or e-Router) connected to the cable pNTP must be compliant to this.

4.2 IP Address configuration of the SIP Device

Communication between a SIP device and the NGN platform is only permitted from a specific IP Range. To meet this requirement the SIP device must use DHCP to obtain the IP parameters. IP communication is only permitted if the DHCP configuration was successful. The SIP device must be compliant to [4]. A manual configuration of the IP address is not supported. In this case, IP communication will not be possible. In order for the VoIP service to work, the SIP device must use the IP address assigned by DHCP as the source in SIP and RTP packets.

For the DHCP Provisioning Server to recognize the SIP device, the DHCP Request must contain the MTA MAC-Address as the source address. Further the DHCP Option-60 “Class-ID” must be set in the DHCP request coming from the sip device. The “Class-ID” must identify the interface where the request comes from and should be unique for the model of the SIP device.

Note: This provisioning flow is different to the provisioning of an MTA as described in the Packetcable standard. According to the Packetcable standard, after the MTA obtained the IP address via DHCP, TFTP is executed to download a configuration file to the MTA. A cable device (MTA) connected via a pNTP to the NetCologne cable network will not obtain a MTA configuration file. After successful configuration of the IP address via DHCP, the provisioning of the SIP device is finished. Any TFTP request from the SIP device will be discarded.

IP communication from the public Internet to the NGA platform is not supported. Therefore, the cable modem or e-Router cannot communicate to the NGN platform using the IP address of the HSI interface.

4.3 Quality of Service

To assure voice quality, separate Service Flows are used for VoIP.

For RTP in upstream- and downstream direction, these service flows are created by the cable modem during call setup using dynamic Service Flows operations. For this, the cable modem must be compliant according to chapter 11.2 in the DOCSIS 3.0 MAC and Upper Layer Protocols Interface specification [5]. Only DQoS-lite is supported.

The Service Flows for SIP signaling are static and are set up during registration of the cable modem with the CMTS.

4.4 Provisioning of the SIP Device

The IP parameters are configured as stated in chapter 4.2. No auto provisioning of SIP parameters is supported. These parameters must be configured manually within the SIP device.